a student to acquire a first-hand knowledge of minerals and their distinguishing characters and ultimately a facility in identifying the commoner species at sight. There is a general classification occupying more than 130 octavo pages based on physical characters, especially streak, colour, and hardness, in the order named. After a rather full account of blow-pipe and other convenient chemical tests, including some which are not commonly employed in this country, there is another classificatory table of 70 pages constructed to assist in the identification of minerals by this means. This is followed by a third table based on the crystalline system and hardness. Perhaps greater stress might have been laid on specific gravity, the determination of which is frequently one of the most rapid means of "running down" a doubtful mineral. Also no mention is made of the use of a permanent horseshoe magnet with special adjustable poles by the help of which the comparatively weak magnetic character of minerals like monazite can be easily recognised even in the field. J. W. E.

(1) *Botany for Students of Medicine and Pharmacy.* By Prof. F. E. Fritch and Dr. E. J. Salisbury. Pp. xiv+357. (London: G. Bell and Sons, Ltd., 1921.) 10*s.* 6*d.* net.

(2) *Junior Botany.* By T. W. Woodhead. Pp. 210. (Oxford: Clarendon Press, 1922.) 3*s.* 6*d.* net.

(3) *The Elements of Vegetable Histology.* By Prof. C. W. Ballard. Pp. xiv+246. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1921.) 18*s.* net.

(1) Prof. Fritch and Dr. Salisbury have prepared an elementary text-book, which is stated in the preface to be for the use of students of medicine and pharmacy. A large number of new figures of plant structures are produced, and many of them will form a useful addition to botanical illustration. A few, however, such as Figs. 69 and 71, are too diagrammatic, sketchy, or ragged to be desirable for elementary students, and of course they are of no use for any other purpose. The book begins with the plant as a whole, using the Shepherd's-purse as type. It goes on with several chapters on the various plant organs and their functions. The chapter on plant cells concludes with an account of protoplasm in colloidal terms. Growing points, tissues, cell contents, and the structure of roots, stems, and leaves are then carefully treated, followed by physiology and the study of types. The book ends with a chapter on heredity and evolution, and an appendix dealing with reagents and methods. It covers adequately the syllabus for medical students and is one of the best we have seen for this purpose, but it is questionable if a somewhat more biological and scientifically imaginative treatment of the subject would not be to the advantage of elementary botanical teaching.

(2) The second volume under notice is a neatly produced little book of more elementary character, and well illustrated, the 140 figures being new with one exception. It begins with a chapter on the garden stock, followed by condensed treatment of seeds and germination, roots and their function, the shoot and its physiology, hibernation and movement in plants. The second part deals with the structure and biology of the flower, including pollination, fruits, dispersal, etc. Every beginning student would find it useful, particularly for its studies of flowers and fruits, and the price is very moderate.

(3) The only features we can recommend in Prof. Ballard's book are the paper and binding, and the first and the last chapters, dealing with the structure and use of the microscope and its accessories. The body of the work is too crude, even for the pharmacy students for which it is intended, to deserve the name of botany. A single quotation from p. 122 will be sufficient to indicate how many errors can be packed into one sentence. "Communication between the various cells forming a tracheid is effected by means of pores in the vessel walls." The illustrations can only be characterised as for the most part very poor. Fig. 29 is intended to illustrate mitosis, and is stated to be "modified" from Strasburger's text-book. The drawings are almost caricatures. They show centrosomes where none exist, and the name "polar bodies" is given to them! It is a disservice to botanical science to publish a book of this character. R. R. G.

The Autonomic Nervous System. By Prof. J. N. Langley. Part I. Pp. viii+80. (Cambridge: W. Heffer and Sons, Ltd., 1921.) 5*s.* net.

THE present small volume gives a very useful summary, clearly and concisely written, of the present position of our knowledge of the subject of which it treats. The author divides the peripheral nerves into somatic and autonomic, and the latter into sympathetic (thoracico-lumbar, to all regions of the body), enteric (plexuses of Auerbach and Meissner), and parasympathetic, which is again divided into tectal (or ocular, supplying the sphincter of the iris and the ciliary muscle), bulbar (alimentary canal from nose and mouth to large intestine, with appendages, including the lungs), and sacral (lower part of large intestine, bladder, and external genitals). The several chapters deal with the divisions of the autonomic system and nomenclature; the general plan of origin and of peripheral distribution; the nerve fibres of the autonomic system; the specific action of drugs on the sympathetic and parasympathetic systems; and the tissues innervated. Each chapter is followed by a bibliography of important papers and by a series of notes.

First Course in the Theory of Equations. By Prof. L. E. Dickson. Pp. vi+168. (New York: J. Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1922.) 8*s.* 6*d.* net.

THE introduction to the Theory of Equations contained in this volume is wide enough to cover the needs of all except those who aspire to become mathematical specialists. The methods throughout are strictly elementary, the treatment reaching the algebraic solution of cubic and biquadratic equations without any reference to substitutions or group-theory. Useful chapters on determinants and elimination are included, while another one deals with elementary properties of symmetric functions. The book contains a severe course of computation within the scope of its subject-matter, and a considerable proportion of the abundant examples are numerical in character. Two subjects avoided by most writers of elementary

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text-books are discussed in a satisfactory and convincing way: (1) the impossibility of trisecting an angle, and (2) the construction of a regular polygon of seventeen sides, by the methods of Euclidean geometry. Prof. Dickson's book possesses all the merits of an excellent text-book, and it is to be hoped that its circulation will be a wide one.

Department of Scientific and Industrial Research: Fuel Research Board. A Handbook on the Winning and the Utilisation of Peat. By A. Hausding. Translated from the Third German Edition by Prof. Hugh Ryan. Pp. xxiii + 506. (London: H.M. Stationery Office, 1921.) 30*s.* net.

An account of some processes for the utilisation of peat, particularly as a fuel, with references to German patents is given in the volume under notice. The mechanical details are better dealt with than the chemistry, which is often ludicrously inaccurate. The translator, indeed, often remarks on the latter point, and on the inaccuracy of the calculations, but makes no attempt to put things right. Some of the illustrations (*e.g.* Figs. 16, 46—which seem to be repeated in 54, 68, 69, 71, etc.) are very poorly reproduced. In spite of obvious defects the book contains a large amount of practical information not otherwise available in English, and will be of value to those interested in peat utilisation. An appendix, giving a reasoned account of the complete failure of some recent schemes, would have been instructive. The statistical information should be compared with that contained in the Final Report of the Nitrogen Products Committee, which is probably more accurate.

The Petroleum Industry: A Brief Survey of the Technology of Petroleum based upon a Course of Lectures given by Members of the Institution of Petroleum Technologists on the occasion of the Petroleum Exhibition, Crystal Palace, 1920. Edited by A. E. Dunstan. Pp. vi + 346. (London: The Institution of Petroleum Technologists, 5 John Street, Adelphi, n.d.) 14*s.* 6*d.*

The petroleum industry is of peculiar interest and importance to the British Empire, and all readers of Nature will welcome the appearance of the present volume. The series of lectures by experts have been carefully co-ordinated, and the result is very readable. All phases of the industry, from the prospecting for oil to the various uses of the finished products, are treated in a way which is a model of lucidity combined with accuracy of detail, and the book cannot fail to be of interest both to the specialist and to the general reader. The illustrations are particularly good. In the opinion of Sir Frederick Black "oil is not likely to supplant coal, but should supplement it"—a wise counsel.

Town Gas Manufacture: A Practical Introductory Treatment of the Equipment and Processes of an Average Gas Works, for Students, Junior Gas Engineers, and others connected with Gas Works. By Ralph Staley. Pp. xii + 108. (London: Sir I. Pitman and Sons, Ltd., 1922.) 2*s.* 6*d.* net.

The scope of this book is sufficiently indicated by its title and sub-title. The accounts of the manufacture of gas coal and water gas, including purification, are brief but clear, and the illustrations are good. There is mention of "great pressure setting up heat" in stacks of coal (p. 6), and "high heats" (pp. 81-82), meaning high temperatures. The account of the reaction in the gas producer is out-of-date, while washing with anthracene oil might have been mentioned as a method of removing "naphthalene, that mysterious bugbear." The fact that carbon monoxide is dangerously poisonous is also worthy of mention to junior gas engineers. The book should be very interesting to students of chemistry as well as to those intending to enter gas works.

A First Book of Chemistry for Students in Junior Technical Schools. By Dr. A. Coulthard. Pp. viii + 156. (London: Sir I. Pitman and Sons, Ltd., 1922.) 4*s.* 6*d.* net.

Dr. Coulthard's book has some features which distinguish it from the scores of "elementary" or "junior" text-books which have appeared in recent years. It is quite up-to-date in its information; the scope is limited but is still sufficient to give a good view of the fundamental laws of chemistry, although the atomic theory is not included, the book finishing with equivalents. In connection with class work and practical work (over a hundred good experiments are described) the book should be found useful, and it may be recommended for use in junior classes. Ten years ago a book of this size would have sold for two shillings at the outside, but the price is probably reasonable nowadays.

Manuel de parfumerie. Par I. Lazennec. (Bibliothèque Professionnelle.) Pp. 281. (Paris: J.-B. Baillière et Fils, 1922.) 8 francs.

M. René Dhommée is editing an encyclopedia of 150 volumes on "travail national," which is intended for French artisans. The idea is good, and corresponds in many ways with that of the "Life and Work" Series now being published by Messrs. Macmillan. The scope of the book is similar to that of Parry's "Perfumes," recently noticed in Nature, but is not quite so full on the scientific side. The technical processes are described in detail, with illustrations, and there are numerous recipes (which are not given by Parry). The book should fulfil its object, and we wish the editor success in his enterprise.

Oils, Fats, and Fuels. By T. Hull. Pp. viii + 143. (London: Blackie and Son, Ltd., 1921.) 3*s.* 6*d.* net.

A very elementary account of the subject suitable for students in technical schools and classes will be found in this book. The chemistry of the materials and processes are not dealt with, formulæ and equations being purposely omitted. There is no index. On p. 128 the composition of "modern coal gas" is given as containing only 8 per cent. of carbon monoxide and 3·5 of "oxygen, nitrogen, etc." This must refer to genuine coal gas and not to the "modern" variety. No mention of fat hardening is made.

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